

CHAPTER VII

Accelerated Training

The demand for the organization of specialized units was but the last hurdle in an unprecedented race to fill the already swollen Engineer troop basis. Pearl Harbor signaled a period of urgency in which to get as many men as possible organized into units and readied for commitment overseas. At first getting the requisite number of men presented no obstacle. The supply of manpower seemed inexhaustible. The most formidable block to Engineer preparations in 1942 was the shortage of officers and the training of the 241,733 enlisted men called into the Engineer service.

The Shortage of Officers

Months before the Engineers glimpsed the full measure of their commitments, they expressed concern about the dearth of experienced leaders. The detail of one officer to the General Staff in January caused Sturdevant to object that "we need everybody we now have for troops." He conceded that the Officer Candidate School would produce "some 4,000 green officers" in the next twelve months, but he warned, "if we are to build efficient organizations we certainly need some leavening experience to guide them."¹ There was reason for his concern. The Engineers faced a cut in their allotment from West Point. They had received fifty of the Academy's 1941 graduates. In June 1942 they would receive only thirty-nine and six of these would go directly to the control of the Air Forces or

Armored Force. By March most of the Reserves would have been called into active service. The new crop of ROTC graduates would add a few hundred. Culling the lists of former Reserves and transferring some from non-Engineer to Engineer service might yield a few hundred more. But for the most part the Corps had to look to other sources than those that had supplied the officers for units activated during 1940 and 1941.

On 3 January 1942 Bessell, the chief of the Military Personnel Branch, described the sources to be tapped. Approximately 1,000 Reserve officers would be called to active duty within the next few months, placed in a pool, and given refresher training. The output of the Officer Candidate School had been expanded from 230 to 1,000 per quarter. Finally, authority would be sought to commission 500 officers from civil life, not for duty with troop units but for assignment to desk jobs with the military construction program so that a corresponding number of troop-age officers then employed on that program could be assigned to engineer units.²

¹ Memo, ACofEngrs (Sturdevant) for CofEngrs, 31 Dec 41. 320.2, Engrs Corps of, Pt. 14.

² (1) Personal Ltr, Lt Col William N. Leaf, Senior Instructor Engr Tactics USMA to C of Mil Pers Br, 19 May 42. 210.3, Engrs Corps of, Pt. 21. (2) 2d Ind, O&T Br to TAG, 21 Jan 42, on Ltr, TAG to OCE, 26 Nov 41, sub: Tng Res Offs at Sv Schs. 353, Orgn Res, Pt. 14. (3) Rpt of Activities of Mil Pers Br Wk Ending 17 Mar 42. 020, Engrs Corps of, Jan-Mar 42. (4) Memo, C of Mil Pers Br for C of Adm Div, 3 Jan 42. 320.2, Engrs Corps of, Pt. 15.

Prominent among the arguments advanced in support of the consolidation of the military construction program under the Corps of Engineers had been that it would save administrative overhead. The existing field organization of the Engineer Department, overwhelmingly staffed by civilians, could handle the job. Officers had already been released from the Engineer Department and could continue to be released and replaced by commissioning these civilians. Having confidence in this logic the Military Personnel Branch believed that the Engineer Department could disgorge even more officers than would have to be replaced by appointments from civil life. The expectation in January 1942 was that something in excess of 500 officers would become available for assignment to troop duty via the military construction program.

In accordance with this understanding the Military Personnel Branch sent an advance warning to Division and District Engineers. For months the branch had been coding applications for commissions. The districts would soon receive a list of names of individuals considered suitable to replace troop-age officers. The districts should meanwhile submit the names of those to be replaced. The response to this communication was far from gratifying. After declaring flatly that no surplus of officers existed, the Engineer of the Lower Mississippi Valley Division named nine officers of troop age, all of whom he considered key men who should not be removed unless there was no alternative. A review of the replies from the field showed that most of the names submitted for release were those of Quartermaster officers, who, even had they been suitable for assignment to engineer troop units, could not be considered eligible because they were slated to be re-

turned to their own corps. Bessell, hastening to disclaim any intended interference with the progress of the construction program, promised to restrict transfers to those officers declared surplus by District and Division Engineers.³

About this time the Construction Division, worried about the fact that its program was behind schedule, lined up squarely behind those who claimed there was no surplus. Robins, its chief, had become convinced that there were too few officers on military construction projects, and on 24 March 1942 directed Division and District Engineers to take on more. Fully aware, however, that few Regulars would be assigned to construction duties in the future and that pressure to release Reserves of troop age would continue, he urged the field to prepare to staff itself with officers commissioned from civil life. Hard on top of this communication Division Engineers received a telegram from the Military Personnel Branch, asking for immediate submission of the names of company grade officers who could be released without violating Robins' directive. The officers were needed for the construction units then being activated for work in the Middle East and did not have to be of troop age. Only after the Military Personnel Branch phoned to read off the names of the first group of officers to be reassigned did the Construction Division learn about the existence of the telegram. The howl of pain that went up swelled into a roar of indignation when the Construction

³ (1) C/L 1090, 19 Jan 42, with longhand note, sub: Reasgmt and Repl of Trp Age Offs Now on Constr Duty. 210.3, Engrs Corps of, Pt. 18. (2) Ltr, Miss. River Commission and Lower Miss. Valley Div Engr to CofEngrs, 6 Feb 42, same sub. 210.3, Engrs Corps of, Pt. 19. (3) Ltr, C of Mil Pers Br to Great Lakes Div Engr, 19 Feb 42, same sub. Same file.

Division found that twenty Engineer officers had been removed without its knowledge. The disgruntled deputy chief of the Construction Division, on seeing another list of officers slated to go, commented that, although the release of a few of them might actually be an advantage, on the whole the action would disrupt the construction program. A meeting with Reybold was scheduled forthwith.⁴

The resulting clarification of policy put a considerable brake upon the activities of the Military Personnel Branch. Immediate objectives were set forth as follows:

- a. The expeditious and efficient prosecution of the war construction program.
- b. To maintain the proper number of officers required for the prosecution of the war construction program.
- c. To make maximum use of over troop-age officers and of officers appointed from civil life for special service who have had no military training.
- d. To release troop-age officers qualified for duty with troops to the maximum extent consistent with *a* and *b* above.

That much being a victory for the Construction Division, the field was again urged to bring in replacements as understudies to troop-age officers and was put on notice that no officers of troop age would be assigned to construction duties except in "very unusual cases."⁵ The Construction Division was resigned to this policy as applied to the future, but continued to resist the reassignment of its experienced officers. "I'd like to remind you," the South Atlantic Division Engineer told the chief of the Construction Division's Operations Branch in mid-April, "that they've just taken five regulars from me and are only giving me one in return." The chief of the Operations Branch doubted that anything could be done about it. Although he was inclined "to turn down

all these requests for pulling people away," he was "under constant pressure" to release Regular troop-age officers other than District Engineers and their top assistants.⁶ Still the Construction Division did succeed in holding up a good many transfers. Only fifty out of ninety officers listed by the field as subject to reassignment in late April were approved for release.⁷

Meanwhile, after the publication of the January 1942 Troop Basis, the Engineers arrived at a better estimate of officer requirements. With 131 new units scheduled for activation, more than 8,000 officers would be needed with troops alone by the end of the year. As of March 1942 there were 823 Regulars, 5,453 Reserves, 504 National Guardsmen, and 106 officers commissioned from civil life—a total of 6,886 distributed as follows: overhead, 831; construction duty, 2,070; service commands, 389; and troops, 3,596. With a large military construction program scheduled through 1942, the Engineers would have to add about 4,500 officers to serve with troops. The bulk of them would be graduates of the Officer Candidate School (OCS).⁸

When the Army offered enlisted men the opportunity to become candidates for commissions in July 1941, the main value of the

⁴ (1) C/L 1423, 24 Mar 42, sub: Off Pers on Constr Projects. (2) Personal Ltr, ACofEngrs (Robins) to Col John S. Bragdon, South Atlantic Div Engr, 24 Mar 42. 210.1, Engrs Corps of, Pt. 7. (3) Memoranda in 210.3, Engrs Corps of, Pt. 12.

⁵ C/L 1479, 13 Apr 42, sub: Mil Pers Policies: Asgmt of Constr and Utilities Offs.

⁶ Tel Conv, Bragdon, South Atlantic Div Engr, and Col Strong, C of Opns Br Constr Div, 17 Apr 42. Groves files, Airfields.

⁷ Rpt of Activities of Mil Pers Br for Wk Ending 24 Apr 42. 020, Engrs Office C of, Apr–Jun 42.

⁸ (1) Ltr, CofEngrs to TAG, 12 Feb 42, sub: Allot of Grads USMA, Class of 1942. 210.3, Engrs Corps of, Pt. 19. (2) Ann Rpt OCE, 1942.

innovation was believed to lie in the boost it would give morale and the opportunity it would afford to put the talents of outstanding selectees to better use. Only secondarily was the program intended to provide a cushion in case of further expansion of the Army. Although officer candidates were supposed to represent the cream of the citizen soldiers, the more important of the standards which the Army established as a guide to selecting them were so indefinite that much was left to personal judgment. The most important qualification of all—potential leadership—was completely undefined. The candidate's ability to learn was deemed sufficient if he had achieved a score of at least 110 (Classes I and II) on the Army General Classification Test. The Army did not exclude anyone solely because of lack of formal education. It was enough if the candidate possessed "such education or civil or military experience as will reasonably insure . . . satisfactory completion of the course" although for certain services, the Corps of Engineers among them, more weight was to be given to the individual's technical preparation.⁹

The graduate of OCS was not expected to know much. At the end of the twelve-week course he was supposed to have acquired sufficient knowledge to perform "reasonably" well the duties of a junior officer in a unit undergoing training. He would come to the unit as an apprentice with enough general information to enable him to profit from the practical experience he would get thereafter. Perhaps he would take advanced courses later, but this was not the concern of the OCS.¹⁰ The course of study offered at the Engineer OCS at Fort Belvoir was designed to teach the candidate how to lead enlisted men in the performance of engineer duties. Success in attaining even

this objective, as experience invariably demonstrated, depended as much upon the caliber of candidates received at the school as upon the course of study and quality of instruction. Twelve weeks was too short a time to turn an engineer soldier into an Engineer officer—even a green Engineer officer—unless the individual had much to offer at the outset. The first class of Engineer officer candidates—the only class to graduate before Pearl Harbor—enrolled at the Engineer OCS on 7 July 1941. Sixty-seven of the ninety-seven students graduated. The second group, which entered the last week of October, contained 218 candidates, 167 of whom were successful. This second was the last class chosen for reasons of morale. The next group of candidates, which entered in January, was more than a third again as large as the second, and, had its quota been filled, would have been more than twice as large. The fourth class was indeed twice as large. It entered two weeks after the third so that a production of 4,000 officers could be achieved in 1942. On 16 January G-3 directed the Engineers to fix the capacity of their OCS at 3,680. By the end of May additions to the troop basis had created a demand for 1,200 more officers. Plans were immediately laid to expand the school's capacity to reach 5,160 by 30 September.

⁹ (1) Robert R. Palmer, Bell I. Wiley, and William R. Keast, *The Procurement and Training of Ground Combat Troops*, UNITED STATES ARMY IN WORLD WAR II (Washington, 1948), pp. 327–28. (2) Watson, *Chief of Staff*, p. 271. (3) WD Cir 126, 28 Apr 42.

The following discussion of the Engineer Officer Candidate School, unless otherwise indicated, is based upon Outten J. Clinard and George H. McCune, *A Survey of the Source Materials for a History of the Engineer Officer Candidate Course*, an unpublished study with supporting documents, in EHD files.

¹⁰ Palmer, Wiley, and Keast, *op. cit.*, pp. 331, 361.

In establishing criteria for the selection of candidates the War Department deemed it "desirable" that Engineer candidates have "an engineering degree or equivalent knowledge or special mechanical or engineering training."¹¹ In the atmosphere of scarcity which prevailed during 1942, quantity became the overriding factor. Quality, while not forgotten, was a luxury the Army could not afford. The sacrifice of quality to quantity showed itself both in the selection of candidates and in the lowering of standards for graduation. Accustomed to high professional competence and qualities of leadership in their officers, the Engineers refused to accept the inevitable without a struggle. But it was lack of intellectual attainments, rather than leadership, that the Engineers deplored most often. The conviction seemed to be that ability to lead would follow in the wake of knowledge. To the extent that confidence grows with knowledge this was sound reasoning. It was also true that many of the tasks performed by the Engineers did not call for the same degree of courage as those demanded in the combat arms but did call for special knowledge.

Complaints about the poor educational background of Engineer candidates began in March 1942 when the commanding general of the Engineer Replacement Training Center (ERTC) at Fort Belvoir despaired of filling his quota. Of 3,050 men then at the ERTC, he could produce only 52 with a year or more of study in engineering, geology, architecture, or science, and only 11 having college degrees with majors in any of these subjects. Some of these men would choose to attend the OCS of other branches; some would not have the necessary aptitude for leadership. After getting a similar report from the other ERTC at

Fort Leonard Wood, Missouri, Sturdevant asked The Adjutant General to correct this situation. Sturdevant was at a loss to understand why the Engineers were not receiving more college graduates since he understood that almost 4 percent of all inductees had bachelor's degrees. He agreed that lack of formal education should not be established as an absolute barrier to officer candidacy but hastened to point out that "in a technical arm or service the officer personnel must include a large percentage of technically trained individuals." He asked that the Engineers be accorded a greater share of men with degrees in engineering or allied subjects and a larger share of those who, while not college graduates, had had some college courses in engineering.¹²

By the end of the month OCE had heard the same story from the OCS commandant. "The Engineer Officer Candidate School is not receiving the calibre of men who should be available," wrote Brig. Gen. Roscoe C. Crawford. Only about 6 percent of the candidates were college graduates in engineering and this was the group most likely to succeed. Over 90 percent with engineering degrees had been graduated from OCS as against 82 percent with degrees in other subjects and 77 percent who had some college courses in engineering. Although Crawford naturally urged that the number of engineers be increased, he was willing to settle for what he could get. "The only definitely unfavorable group is that which did not graduate from high school," he wrote on 31 March 1942. "It is believed that every effort should be made to send to

¹¹ WD Cir 126, 28 Apr 42.

¹² 1st Ind, ACofEngrs (Sturdevant) to TAG, 14 Mar 42, on Ltr, CG ERTC to CofEngrs, 2 Mar 42, sub: Shortage of Trainees with College Engineering Education. 353, ERTC Ft. Belvoir, Pt. 1.

the Engineer Officer Candidate School not only the largest possible number of engineering college graduates, but also interested applicants otherwise suitable who have at least one year of college, not necessarily in engineering. High school graduates without college training will also be acceptable if they are suitably qualified by outstanding leadership and engineering experience.”¹³

Concerned about quantity, the War Department was inclined to think the standards for selection as established by the Engineers, the Ordnance Department, and the Signal Corps were set too high. These services must abandon peacetime notions, the War Department wrote on 6 April 1942:

While in peace, the bulk of the officers of a technical branch may be engaged in planning, research, design and construction duties demanding a higher degree of training along those lines; in war the bulk of the officers of those branches is employed with field force units of the branch in support of the combat arms. While this higher training is a definite asset it is not an essential requirement of a platoon or company commander of a technical unit supporting the combat arms. The required basic knowledge of planning and construction by these commanders is taught at the officer candidate schools.¹⁴

In view of the growing number of large-scale construction projects being handled by engineer troops overseas, this statement had but limited application to the Corps of Engineers. The selection of officers with civilian education or experience was essential. The high rate of failures in the Engineer OCS further reflected this viewpoint, that only qualified men could fill such positions. G-1, still concerned over quantity, expressed displeasure at the fact that about one fourth of the Engineer candidates had failed to graduate. Sturdevant reluctantly adopted the position of his superiors. The

War Department’s “concept of officer qualifications . . . must be accepted as correct,” he wrote to Crawford on 20 April. “Much as high professional qualifications are to be desired, an unpredictable expansion of the Army can only result in a lowering of standards which must be accepted as a necessary sacrifice.” OCS had to assume the responsibility for instructing the candidates received. “A high rate of attrition may be as much of an indictment of the methods of instruction as of the quality of the candidates,” he concluded.¹⁵

Crawford did not agree that quantity was that important, but he nevertheless expressed concern about the number of failures. He saw four ways in which to reduce them. Standards for graduation could be lowered even though he believed they were already at the danger point. “To make further concessions is not a matter of making a necessary sacrifice,” as Sturdevant had phrased it, “it is more a question of accepting a disaster. . . . We are making no compromise on the quality of our guns, tanks, planes, etc. Why compromise on the most vital thing to the whole effort—leadership?” He agreed with Sturdevant that another way to reduce the number of failures was to improve the quality of instruction. The OCS had too few instructors and the ones they had were not good enough. Repeated attempts to get officers from the field had been largely unsuccessful. The faculty had of necessity been built up from gradu-

¹³ Ltr, Comdt Engr Sch to CofEngrs, 31 Mar 42, sub: Standards of Engr Off Candidates. Clinard and McCune, *op. cit.*, App.

¹⁴ Ltr, AG 352 (4-5-42) MT-A-M to All Comdrs, 6 Apr 42, sub: Off Candidates, Tech Brs. Clinard and McCune, *op. cit.*, App.

¹⁵ Ltr, ACofEngrs (Sturdevant) to Comdt Engr Sch, 20 Apr 42, sub: OCS Standards of Performance. Clinard and McCune, *op. cit.*, App.



BRIG. GEN. ROSCOE C. CRAWFORD, *Commandant of the Engineer School, June 1940 until November 1943.*

ates of officer refresher courses and from the OCS itself. "Until properly qualified instructors in sufficient numbers are made available . . ., we should accept as a necessary sacrifice," using Sturdevant's phrase again, "a smaller number of graduates." Along with getting more and better instructors Crawford favored continuing the struggle for better candidates. Meanwhile the OCS had introduced a fourth way to salvage more candidates by giving those who seemed able but slow (about 10 percent of each class) more time to adjust. After five weeks at the school these men were placed in a special unit for two weeks after which time they were either returned to the course or discharged.¹⁶

Sturdevant had meanwhile visited the ERTC at Fort Leonard Wood and informed its commander, Brig. Gen. Ulysses

S. Grant, III, that he must fill his quota. Up to that time the center had refused to appoint candidates with less than two years of college or engineering experience. Grant lowered these standards reluctantly, warning that the selection of men with only a high school education and no experience in engineering would only add to the number of failures at the school.

By summer the War Department had modified its position somewhat. In June and July it recognized the existing shortage of Engineer candidates and directed other arms and services to cull their ranks for highly qualified men, particularly graduate engineers, and any others with engineering training or experience. But in mid-September, with Engineer OCS quotas still unfilled, the War Department became alarmed at the fact that some boards had excluded men simply because they lacked the technical and educational background indicated in the directives of the previous summer. The War Department pointed out that while such highly qualified candidates were desirable, the quotas should be filled out with men of intelligence and native ability, the real essentials for success at OCS.

If ability to learn as measured by AGCT scores had been the only criterion for a successful officer the Engineers would have had no cause to complain. Of 21,958 candidates enrolled between 21 March 1942 and 1 April 1944 all had received high marks and a good many of them exceptionally high marks on the Army General Classification Test. Eleven percent tested 140 or over; 22.6 percent scored between 130 and 139; 34.9 percent between 120 and 129; and 27.4 percent between 110 and 119.

¹⁶ 1st Ind on ltr cited n. 15. Clinard and McCune, *op. cit.*, App.

While ability to learn was a great asset in developing leadership, it provided no absolute insurance. For the Engineers it was particularly difficult to fill quotas with potential leaders because the Engineers were assigned so few enlisted men in Classes I and II from which all officer candidates had to be selected. During the period March–August 1942 only 23.4 percent of the men assigned to the Corps of Engineers were in Class I and II—the lowest percentage of all the arms and services. Although the Engineers fared better during the year 1943 when this percentage rose to 29.1, they remained in an unfavorable position as compared to most other branches. Under such circumstances replacement training centers and unit commanders found themselves hard put to give much weight to potential leadership or to formal education; the most they could do was to find men who met the specified standards of intelligence.

One reason why the Engineers did not succeed in getting more men in the higher classes was the persistence of the idea that the Corps could function perfectly well with large masses of common laborers. Although the Engineers took every opportunity to point out the fallacy of this idea, it would not down. The other reason for their failure to gain access to the most suitable sources was the preferential treatment accorded the AAF in the assignment of personnel. Under a policy established in February 1942, 75 percent of all white enlisted men destined for the AAF were to have scored at least 100 on the AGCT. The objections of AGF and SOS received some consideration in the fall of 1942 when the percentage was lowered to 55, but the fact remained that the top cream had been skimmed before AGF or SOS were allowed into the market.¹⁷

The educational background of Engineer

candidates was therefore limited. During the period 21 March 1942 to 1 April 1944 candidates with undergraduate degrees in engineering numbered only 1,750 or 8 percent of the 21,958 enrolled. The number of college graduates holding degrees in subjects other than engineering was but 3,698, or 16.8 percent. A much larger number—8,568 or 39 percent—had some college education. Most of the remainder—over 25 percent of the total enrollment—were high school graduates only. During the early period of peak demand for officers the percentage of candidates with college degrees must have been even lower than 8 percent because after January 1943 ROTC graduates began to enter OCS and by 1944 comprised a large percentage of the student body. Since the OCS failed to receive the number of highly qualified men desired, the administration strove all the harder to improve the quality of instruction in order to produce satisfactory officers.

As Crawford had pointed out in March 1942, the school had tried unsuccessfully to secure officers with field experience to act as instructors. In the spring and summer of 1942 the school had to turn to its own graduates to fill the growing vacancies on the faculty. By August 1942, 35 percent of the instructors had less than three months' commissioned service. That month the situation was bettered by the introduction of a rotation system. Under this setup a number of officers having at least a year's experience with troops were to be assigned to the school faculty each month, their places to be taken by inexperienced second lieutenants who had been acting as instructors. Following assignment to the faculty the experienced officers would enter newly activated units.

¹⁷ Palmer, Wiley, and Keast, *op. cit.*, pp. 17, 18, 21, 23–26.

"The many advantages of such a rotation policy can be easily seen," the Engineers advised the Director of Military Personnel, SOS. "The Engineer School gains instructors with experience in the field, newly activated units obtain a source of experienced personnel, troop units receive qualified loss replacements junior in rank to those officers on duty with the unit."¹⁸

The rotation system was one of two means adopted by the school in an effort to raise the standard of instruction. The other, introduced about the same time, was a course in instructional methods. Like other courses in methods of teaching, this one stressed effectiveness of presentation, and through classroom observation and conference gave personal guidance to the teacher. The inauguration of the instructional methods course and the receipt of more teachers who were experienced with troops combined to improve the quality of instruction during 1943, but by this time the desperate need for officers had passed and the school's capacity had been lowered.

During the first two years of its existence the course of study given at the Engineer OCS varied little. Even lengthening the course to seventeen weeks in July 1943 brought only slight changes in subject matter. In the space of twelve weeks the candidates took about forty subjects varying in length of instruction from one to fifty hours. About one third of the school hours were allotted to pioneer and Engineer subjects, the remainder to subjects common to all arms and services. Although a good many subjects were introduced by lectures, conferences, and demonstrations, and some of the shorter courses were entirely confined to this method, the school gave as much instruction as possible by means of practical work. Thirty-one of the thirty-seven hours

allotted to the study of floating bridging were set aside for exercises, including a night crossing in assault boats. Such exercises satisfied several purposes. They revealed a candidate's knowledge of the subject and his ability to put his knowledge into practice. They afforded an opportunity for developing initiative, judgment, and the ability to organize a job and give orders, as well as a means of observing whether or not the candidate was developing such skills satisfactorily.¹⁹ In order to be commissioned the Engineer candidate had to attain an average of at least 70 in both academic subjects and leadership qualities. In arriving at this average, school administrators assigned some subjects such as bridging and operation of construction machinery and some qualities of leadership more weight than others.

Almost 12,000 candidates were supposed to be sent to the Engineer OCS to fill classes slated to graduate during 1942. Of the 10,999 that actually entered, 8,925 graduated. In terms of quantity the Engineers were over the hump by the end of that year. The class which graduated on 21 July 1943 was the last large one, the quota having been slashed drastically from 700 to 160 the preceding May. During the nineteen-month period between January 1942 and July 1943 the OCS produced 16,742 successful candidates out of a total enrollment of 21,569. Despite the turn-back system to afford slow learners an opportunity to catch up, the school rejected over 22 percent of those who entered.

While the demand for officers was at its height, however, the percentage of those

¹⁸ Ltr, AC of Mil Pers Br to Dir of Mil Pers SOS, 27 Jun 42, sub: Instructors for Engr Sch. 210.3, Engr Sch, Pt. 4.

¹⁹ Lesson Asgmts for OCS, 20 Apr 42; 2 Nov 42; 1 Apr 43; 1 Jul 43. EHD files.

failing to graduate was consistently less. The class which finished on 30 May 1942 graduated 86.4 percent of its candidates, practically by order,²⁰ and throughout the rest of that year no class failed to graduate less than 80 percent of those who entered. Beginning in January 1943 the percentage of failures began to climb again. The class which finished on 28 April had a mortality rate of over 30 percent—about the same as that of the school's first class when morale had been the keynote of the officer candidate program. The average thereafter was closer to one third than to one quarter.

In each class there were some individuals who dropped out because of physical disability or other reasons. In fact in a good many classes those relieved for such causes outnumbered those who failed because of deficiencies either in leadership or in course work. During the period of peak capacity at OCS physical disability and similar causes accounted for 6.3 percent of the failures. The greatest number—7.5 percent—was judged lacking in ability to lead. Failures because of academic deficiencies accounted for 3.3 percent while 4.3 percent fell down on both leadership and grasp of subject matter.

It may appear inconsistent that after objecting so strenuously to the receipt of candidates who had not been to college, the OCS failed so many candidates on leadership rather than on academic grounds. Several factors must be considered before coming to this conclusion. The primary mission of OCS being to develop leaders, more was expected of candidates on this score. Academic subjects were extremely simple. Much of the candidate's grasp of the subjects taught was measured by written tests, where a good memory went a long way toward the achievement of a passing grade. A candidate

might easily reel off bridge capacities, but he might find it more difficult to take his place in the group erecting the bridge, and he might find his knowledge too slight indeed to enable him to take command of the group with the assurance demanded of a leader.

The Engineers' insistence on the importance of previous education proved justified. As class after class entered and graduated it was demonstrated over and over again that candidates with degrees in engineering had the best chance to succeed and college graduates with majors in other subjects the next best. Of students enrolled between March 1942 and June 1944, 81.3 percent of those with engineering degrees and 80 percent of those with college degrees in other subjects graduated, as compared with 73.4 percent of those who had gone no farther than high school and 61.8 percent who lacked a high school diploma.

The Engineers realized from the beginning that even though officer candidates might possess a solid technical background, their very youth would preclude much working experience. The supply of Reserves which contained older men with several years background in construction had dried up early in 1942. The sudden demand in the spring of that year for officers to man the units being activated for construction duties in the Middle East led the Corps of Engineers for the first time to commission civilians for assignment to troop units. The specialized nature of the duties which general and special service regiments were supposed to perform in the Middle East demanded much in the way of construction experience, little in the way of military knowledge. As the demand for construction

²⁰ Memo, Gen Crawford for Authors, 23 Dec 53.

units mounted, the Corps of Engineers found civilian sources increasingly inviting.²¹

In January 1942 the Military Personnel Branch had about 9,000 applications from civilians desiring commissions in the Corps of Engineers. After a preliminary selection of applicants on the basis of information coded on machine records cards, applicants were to be interviewed. The Military Personnel Branch expected Division and District Engineers to do most of this interviewing. In order to be commissioned direct from civil life, a man had to be over thirty, have had some previous military training, and must not be under orders for induction. But military and age requirements might be waived if it could be proved that the individual's specialty rendered him extraordinarily well qualified for a particular assignment. The War Department allotted a quota of civilian commissions to each branch.²²

On 12 April 1942 the War Department approved the commissioning of 568 officers for assignment to the units slated for the Middle East. The following month the Engineers received authority to commission 350 more civilians for service with forestry companies, aviation battalions, and utilities detachments. The first week in June they were authorized another 1,000 for the recently activated Engineer Amphibian Command. In July, Fowler, alarmed at reports of new units filled up with OCS graduates who knew little or nothing about the operation and maintenance of construction machinery, suggested that additional civilian sources be tapped. Shortly afterward Godfrey registered similar misgivings about the officers coming into aviation battalions and also asked for civilians. In line with Fowler's suggestion, on 19 August the Military Personnel Branch put in a requisition for 450

civilians having five or more years' experience as highway contractors. Godfrey's plea was acted upon the following week in a request for 300 civilians with experience in supervising earth-moving operations on airport or highway construction.²³

During the first half of 1942 the Engineers selected civilians for commissions in accordance with the system suggested by Bessell in which most interviewing and, in some cases, locating suitable individuals was accomplished by District and Division offices. The Engineers were pleased with the results. Almost 3,500 officers (most of them for the military construction program in the United States) had been obtained. On 6 July 1942 the War Department set up a central Officer Procurement Service and curtailed some of these activities. Henceforth the Engineers were to draw up specifications for the type of individuals wanted and to cite the specifications desired upon submitting requisitions. They were to stop trying to find potential officers, although if they happened to know of a particular individual who could fill a particular bill they could so advise the Officer Procurement Service.

The Engineers did not fare very well under the new arrangement and said so. On 10

²¹ Unless otherwise cited, this section on civilian commissioning is based upon correspondence in 210.1, Engrs Corps of, Pts. 5 and 7.

²² (1) Memo, C of Mil Pers Br for McCoach, 5 Jan 42, sub: Appointments of Offs From Civil Life and From Among Former Offs. 210.1, Engrs Corps of, Pt. 4. (2) Ltr, AG 210.1 (1-21-42) RB-A to Cs of Arms and Svs *et al.*, 26 Jan 42, sub: Appointments of Offs From Civil Life in AUS. P&T Div file, ROTC—Policies—Grads, Offs.

²³ (1) Draft Memo, C of Sup Div, 8 Jul 42. 337, Pt. 1. (2) Ltr, Engr AAF to CofEngrs, 12 Aug 42, sub: Commissioning Offs From Civil Life for Duty With Avn Engr Units. 210.1, Engrs Corps of, Pt. 6. (3) Ltr, AC of Mil Pers Br to TAG, 19 Aug 42, sub: Commissions in AUS. Same file.

October 1942, six weeks after requisitions for 750 construction men had been sent in, the Military Personnel Branch claimed that the Officer Procurement Service had produced only ten acceptable applicants. Calling attention to this, the Engineers urged a return to the old system. Actually, steps leading to a compromise had already been taken. On 9 October the Officer Procurement Service agreed to allow the Engineer field offices to locate construction men once again. By 27 October the Officer Procurement Service had turned up 58 men; the Engineers had found 230 apparently good prospects.²⁴

Through the good offices of Brig. Gen. Joseph N. Dalton, Assistant Chief of Staff for Personnel, SOS, the Military Personnel Branch and the Officer Procurement Service succeeded in establishing more harmonious working relationships. The Officer Procurement Service demonstrated that the Engineers were at least partly to blame. During the period 20 August to 31 October, the Officer Procurement Service asserted, it had submitted over a thousand applications to the Engineers, and it charged that 745 of them were still pending in the Military Personnel Branch. The Officer Procurement Service asked the Engineers to furnish more details about desired qualifications. By November Bessell was convinced that the joint effort would work. But there was many a slip between a good prospect and a commissioned officer. As of 22 December 1942 only 132 men had been commissioned and only 37 more applications were pending. The Engineers then concluded that limitations of age and vulnerability to the draft were responsible for this situation and requested a relaxation of these restrictions.

This request came in the midst of the War

Department's announced determination to cut down drastically on the number of commissions from civilian life. From the over-all point of view the shortage of officers had been overcome. The production of Officer Candidate Schools would more than satisfy requirements for 1943. The War Department wished to afford officers and enlisted men already in the Army an opportunity to move into positions commensurate with the experience they had acquired. If civilians continued to be commissioned in large numbers such opportunities would be curtailed. Commissions from civilian life should be restricted, therefore, to highly skilled individuals who could not be produced through the officer candidate program. The Corps of Engineers expressed alarm at the possibility of being cut off from civilian sources. With the lowering of the draft age to 18 the prospect of receiving skilled individuals at OCS became dimmer than ever. Only through civilian sources could they find the 3,000 experts required in 1943. The General Staff recognized, at least in part, the validity of the Engineer case. Highway, airport, and building construction contractors, experts in petroleum distribution, and electrical engineers were included in the short list of specialists who could be commissioned from civilian life. But the General Staff refused to allow the Engineers anything approaching the 3,000 men they wished. All of ASF (exclusive of the Surgeon General's Office, the Corps of Chaplains, and the Provost Marshal General's Office) was given an over-all procurement objective of only 3,250 for the year 1943.

The Engineers continued to insist that OCS graduates could not fill all the vacancies. In March 1943 they asked permission

²⁴ Rpt of Activities of Mil Pers Br for Period Ending 30 Oct 42. 020, Engrs Office C of, Oct-Dec 42.

to commission 3,500 civilians during the next nine months and suggested that the capacity of OCS be reduced by that amount. On 13 October, the War Department cut off appointments from civil life altogether. During the eighteen months that this source was open the Corps of Engineers commissioned 5,616 civilians for service with troop units.²⁵

The variety of sources which the Corps of Engineers drew upon to provide leaders for troop units radically altered the character of its officer personnel. Almost overnight this group changed from a homogeneous to a heterogeneous one, from a group of men with similar backgrounds to one with all manner and degree of professional and military training and experience. To strive for homogeneity was as unnecessary as it would have been impossible, for as the War Department had pointed out in connection with the officer candidate program, the needs of the small peacetime Corps were quite different from those of the wartime Corps. The duties of an officer in the peacetime Corps were apt to be comprehensive; he was in much the same position as the only boss of a small firm. The wartime Corps was a huge factory where workers and bosses alike could specialize. Even so, the Corps of Engineers, like any other organization, had to provide the newcomer with a certain amount of special background before he could assume his duties, however limited. The OCS was one means of accomplishing this objective; another was provided by the Engineer School in a program of instruction for officers that was adjusted to the diverse backgrounds of those who attended.

The shift from a peacetime to a wartime curriculum at the Engineer School had be-

gun in the summer of 1940 with the institution of a four-week (later five-week) refresher course to bring Reserve officers abreast of the latest military doctrine. In October, after the passage of the Selective Service Act and the calling up of the National Guard, the school replaced the refresher course with a five-week instructor course. Graduates of the instructor course, mostly National Guard officers, were being groomed to instruct the cadres for the projected ERTC's. Three instructor courses with a total capacity of 550 officers were planned. Afterward there was supposed to be a reversion to refresher courses, but in February 1941 the Engineers decided to continue instructor courses through the summer. Instead of being assigned to teach at the replacement training centers many graduates of the first instructor courses had been sent to troop units because of delays in the opening of the ERTC at Fort Leonard Wood.²⁶

Only two more refresher courses were given after Pearl Harbor—one for Reserves and the other in the summer of 1942 for ROTC graduates. Thereafter ROTC graduates attended OCS, and in fact made up the bulk of that student body during 1944 and 1945. Like the ROTC graduates, newly commissioned officers from West Point came to Fort Belvoir prior to assignment. Here, in six weeks, the school touched the high spots of the nine-month course they would have

²⁵ (1) Rpt of Activities of Mil Pers Br for Period Ending 15 Mar 43. 020, Engrs Office C of, Jan-Mar 43. (2) Ltr, CofS ASF to Cs of Tech Svs *et al.*, 18 Oct 43, sub: Cancellation of Proc Objectives. 210.1, Pt. 1. (3) Alphabetical Roster of Offs Commissioned From Civil Life, 9 Nov 43. Plan Br Mil Pers Div OCE.

²⁶ (1) 352.11, Pt. 9. (2) 352.11, Pt. 10. (3) P/I Instructor Course, Incl with Ltr, Comdt Engr Sch to TAG, 24 Jul 41, sub: Rpt of Opns of Engr Sch, 1940-41. EHD files.

normally had in peacetime, emphasizing the theory and practice of military engineering and the instructional methods used in the Army.²⁷

The output of the refresher courses and of the Military Academy graduate course was small as compared with two other general courses—the divisional training course and the field officers' course—which were offered for the first time during 1942. The divisional training course was established in January for battalion staff officers and company commanders slated for assignment to newly activated divisions. The idea was to weld these officers into a team by giving them practical instruction in planning and supervising unit training and in administration. Between January 1942 and June of the following year, 371 officers completed this four-week course. The field officers' course had its origins in O&T's concern over the relatively poor showing made by Reserve and National Guard officers at the 1941 maneuvers. In February 1942 the Engineer School enrolled 43 of this group in an advanced course for three months. When the time came for a second class there were no students. Field officers could not be spared for such a long time. Still the need existed. "No instruction is given at the School other than in the Divisional Training Course to fit officers . . . for duty as battalion staff officers," Crawford pointed out in June. "There is also a distinct gap between the basic instruction in the Corps of Engineers and the instruction for division staff officers as carried out by the Command and General Staff School" He proposed a two-month field officers' course, soon to become the most heavily attended general course given. The first class opened

on 7 September 1942. A total of 2,487 officers had graduated by the time the fifty-fifth class finished on 20 October 1945.²⁸

By the summer of 1943 all but the field officers' course and the Military Academy graduate course had been dropped from the school's general training program. The four-week divisional training course, given until 1 May 1943, was broadened to admit officers of nondivisional units. Renamed the cadre officers' course, it offered the key officers of the cadre an opportunity to work together before activation of a unit. Beginning in August 1943 the course was divided into two sections corresponding to the principal categories of officers attending—a combat section and a section for general service regiments and other units. When, in the spring of 1943, the Engineer Unit Training Center at Camp Claiborne, Louisiana, was directed to transfer the military training being conducted for officers appointed from civil life to Fort Belvoir, the Engineer School established a basic officers' course from which 817 were graduated within the next two years. Later in 1943, when the Engineers received by transfer about 1,600 OCS graduates of other arms and services, the school instituted an Engineer training course which gave these men the equivalent of the engineering subjects that were offered at the OCS. During

²⁷ (1) WD Special Staff Hist Div, Schooling of Commissioned Officers, Corps of Engineers, 1 Jul 39–30 Jun 44. (Hereafter cited as Schooling, Commissioned Officers.) (2) Clinard and McCune, *op. cit.*, p. 14. (3) Memo 12, Engr Sch for All Concerned, 19 Feb 43, sub: Résumé of Courses. 210.63, Engr Sch.

²⁸ (1) Quote is from Ltr, Comdt Engr Sch to CofEngrs, 17 Jun 42, sub: Field Offs Course. 352.11, Engr Sch, Pt. 13. (2) Interoffice Memo, O&T Br for Mil Pers Br, 6 Jan 42, sub: Detail of Offs to Advanced Course. 352.11, Engr Sch, Pt. 12. (3) Schooling, Commissioned Officers.

1944 the Engineer School taught a more advanced course to some 1,400 AGF officers who had had troop experience and civilian training in engineering.²⁹

The third and most important means of developing efficient leaders for engineer troops was the school of experience with troop units. On first being assigned to a unit, most OCS graduates displayed lack of confidence and initiative and a reluctance to accept responsibility, but after two or three months' service, most of the men began to act like officers. Comments from overseas on the performances of junior officers varied. Some European commanders expressed complete satisfaction with OCS graduates; others believed that faulty methods of selecting candidates resulted in officers commanding men who were their superiors in education and background. All theaters complained about the lack of technical competence among junior officers. From Europe came reports that they possessed scanty knowledge about the operation and maintenance of construction machinery and that few were prepared to handle jobs in depots or perform other supply functions. From the Southwest Pacific, where construction operations overshadowed all other engineer tasks and where machinery was often operated twenty hours a day, came the most severe criticisms. Commanders in this theater expected Engineer officers to know construction machinery and how to organize and supervise a construction job. All echelons of command agreed that the combat training given at OCS was out of all proportion to what was needed in the Pacific. The OCS began to respond to such complaints in the spring of 1944. By fall of that year, hours allotted to

the operation and maintenance of engineer equipment had been increased from twelve to eighteen, engineer reconnaissance from ten to sixteen. Eight hours had been added to the study of military geography and ten hours to the study of land mines. Henceforth more weight was given to academic deficiencies than to failure to meet standards of leadership. This shift came too late, however, to have any appreciable effect upon the mass of officer candidates who had been rushed through training in the desperate attempt to provide leaders for the units being activated in 1942.³⁰

Engineer Replacement Training

Until the spring of 1941 newly inducted men went directly to units for a full year of service. During the rest of 1941, however, recruits reported to replacement training centers established under the direction of the various arms and services. At these centers, individual instruction in simple military procedures could be standardized. The men would then be ready for group training immediately upon reaching their units. Relieved of the task of basic training, units

²⁹ (1) 352.11, Engr Sch, Pt. 13. (2) Memo, O&T Br for Comdt Engr Sch, 1 Apr 43, sub: Rev of Courses at Engr Sch. 352.11, Engr Sch, Pt. 16. (3) Memo, O&T Br for CG ASF, 31 Aug 43, sub: Cadre Offs Course. Same file. (4) Memo, Asst ExO Tng Div ASF for CofEngrs *et al.*, 12 May 43, sub: Schs for Offs at Unit Tng Centers. EHD file, Special Tng EUTC, Heavy Shop, 1943-44. (5) Memo, Mil Pers Div ASF for CofEngrs, 6 Aug 43, sub: Diversion to CE of Offs of Other Brs. P&T Div file, Engr Tng Course—P/I Gen. (6) Memo, ACofEngrs (Sturdevant) for ACofEngrs (McCoach), 16 Aug 43, same sub. Same file. (7) Ltr, C of WPD to Comdt Engr Sch, 30 Dec 43, sub: Program of Instruction, Engr Tng Course. 352.11, Engr Sch, Pt. 17.

³⁰ Robert B. Killingsworth, *School Training*, pp. 43-45. MS in EHD files.

were expected to attain a higher level of preparation in much less time.³¹

Under this system all engineer troops went to ERTC's under the direction of the Corps of Engineers for twelve weeks of intensive basic military and engineer training. Some specialist instruction was supposed to be given during the twelve-week program, but the Engineers soon abandoned this effort and concentrated upon teaching the recruit the basic duties of an engineer soldier. The emphasis in this stage of mobilization was upon the production of fillers for newly activated units and in the latter part of 1941 the product was sufficient—some 5,000 men each month.

This orderly arrangement did not last. Activations of engineer units in 1942 became so numerous that the ERTC's could no longer meet demands. No expansion of facilities was allowed. Therefore, only units slated for early movement overseas could draw upon the centers for fillers. Most of the remaining product replaced cadres withdrawn to form new units. The urgent requirement for service units in 1942, coupled with the fact that such units had a high percentage of technicians, led the War Department to channel the great bulk of branch-trained fillers into SOS organizations. With the supply still insufficient, 28 training battalions at AGF centers converted to branch immaterial and funneled some 80,000 men into service units, including engineer, between July and October. So few ERTC fillers were available for the engineer units serving with the AAF that in November 1942 the AAF withdrew from this system entirely, setting up its own facilities for training engineer recruits. Despite all these provisions, a great part of the engineer unit fillers in 1942 came to be once more selectees straight from reception centers, without any

intermediate training at replacement centers.³²

It was not surprising that one of the ERTC's was located at Fort Belvoir, traditionally an Engineer center, in spite of limited room for expansion in the adjacent well-populated farming area. Fort Belvoir encompassed a 10-square-mile area 20 miles south of Washington, D. C., on the Potomac River, a short distance below Mount Vernon, in the gently rolling tide-water district of Virginia. Just to the north of Fort Belvoir, across U.S. Highway No. 1, lay a run-down farm, much of it covered with a young growth of pine and scrub oak. This became the site of the first ERTC, opened in March 1941, a typical wartime cantonment with neat rows of two-story frame barracks liberally punctuated with chapel spires.³³

The second ERTC, opened in May 1941, was at Fort Leonard Wood in south-central Missouri. In sharp contrast to the soft outlines of the cultivated Virginia countryside,

³¹ Unless otherwise noted, this section on replacement training is based upon: (1) 353, RTCs, Pt. 1; (2) 353, ERTC Belvoir, Pt. 1; (3) 353, ASFTC Wood; (4) 353, Tng, Ft. Lewis; (5) Wood, 353.01, Tng Scheds; (6) 333.1, ASFTC Wood; (7) Belvoir, 333.1, Investigations and Inspects, 1941-42; (8) 353.15, ERTC Belvoir; (9) 353.15, ASFTC Wood; (10) Wood, *Ft. Wood News Clippings*; (11) Pamphlet, prepared by Adj ERTC Belvoir, 18 Aug 42, sub: The ERTC, Ft. Belvoir, Va. Belvoir, 680.1 RCs, 1940-42; (12) Training of Replacements, Fillers, and Cadres, Corps of Engineers, 6 Mar 41-30 Jun 44 (based upon reports submitted by the ERTC's, and hereafter cited as Tng of Repls). MS, OCMH.

³² (1) Palmer, Wiley, and Keast, *op. cit.*, pp. 170-79. (2) Info Bull 81, 12 Mar 41. (3) For discussion of aviation engineers, see below, Chapter XIV.

³³ (1) Info Bull 81, 12 Mar 41. (2) OCE, Real Estate Progress Rpt, 30 Apr 42. (3) OCE Quarterly Inventory: Owned, Sponsored and Leased Facilities, 30 Jun 44, p. 93. (4) Rough Draft, Hist of Engr Tng Center. Post Hq, Belvoir.

this site lay within the Mark Twain National Forest, in the rocky northern foothills of the Ozarks. The military reservation extended over 113 square miles of rugged cavernous limestone and sandstone hills, heavily covered with pine and hardwood forests and interlaced with numerous clear spring-fed streams. The cantonment area was built on a level ridge just to the west of the broad twisting loops of the Big Piney River, a stream about forty feet wide, well suited for ponton bridge training. Like the Belvoir ERTC, this center enjoyed a moderate climate. Although the summers were hot, the mountains and forests deflected the worst of the Great Plains weather, and although snow fell during the winter it lasted but a short time. In spite of their rough beauty and mild climate, these foothills had attracted few permanent settlers. There were no towns of any size within thirty miles. The closest railroad line was nearly twenty miles away. Cities such as St. Louis, Springfield, and Jefferson City were all about a hundred miles from the center.³⁴

It was apparent at once that the replacement training centers could not supply the number of men required by the Army in the early months of 1942. Within a week after the Japanese attack, G-3 held a conference to discuss how to spread this training so as to reach more men. The War Department recognized the desirability of having all its ground force fillers supplied to units through replacement training centers rather than directly from reception centers, but realized that replacement centers could not be expanded at a rate commensurate with the growth of the Army. But the need for men, whether completely trained or not, was immediate and urgent.

In order to increase the output, the Chief of Staff favored reducing the time spent at replacement centers from twelve to eight weeks. G-3 believed twelve weeks necessary for adequate instruction. Nevertheless, the representatives at this meeting were instructed to prepare for the reduction.³⁵

In cutting replacement training to eight weeks on 19 December 1941, the War Department directed that as few subjects as possible be eliminated. Less time to individual subjects was the preferred method of effecting the reduction. Emphasis was to be placed upon basic individual military training common to all arms. Subjects involving team training could be dropped if absolutely necessary. The Operations and Training Branch, OCE, was fortunate in having just completed a revision of its twelve-week program which differed considerably from the existing published program of 1940 and represented a more realistic scheduling of subjects and hours based upon several months' experience at Belvoir and Wood. This new program was the basis for the eight-week revision.³⁶ (*Table 5*)

³⁴ (1) Inventory cited n. 33 (3), p. 107. (2) Fred W. Herman, "Fort Leonard Wood, Missouri," *The Military Engineer*, XXXIII (March-April, 1941), 108-10. (3) Brief Summary of Events Leading up to the Acquisition and Use of Fort Leonard Wood, Mo. Groves files, Misc Papers. (4) Memo, V. W. Whitfield, Dir Div of Opns, for Col B. M. Casteel, Administrator, 8 Jul 40, sub: Inspec of Proposed Mil Reservation, Missouri National Guard. QM 601.1, Seventh Corps Area—Seventh Corps Area Tng Center.

³⁵ (1) Ltr, TAG to CGs Corps Areas *et al.*, 4 Oct 41, sub: RTC Capacity. Wood, 324.71, Selectees (AG). (2) Ltr, TAG to CGs All Armies and Corps Areas *et al.*, 2 Sep 41, sub: Additional RTC Capacity. 680.1, RTC, Pt. 1.

³⁶ Ltr, S-3 ERTC Wood to OCE, 18 Dec 41. 352.11, ASFTC Wood, Pt. 1.

No subjects were dropped. Most of the reduction was accomplished by cutting off the last four weeks of training. The resulting program produced a basic infantry soldier and secondarily an engineer since the greatest reduction was in technical subjects that had been stressed toward the end of the training period. Presumably, Engineer subjects were the ones which could best be postponed for unit training. The product of the ERTC would be physically hardened and know the fundamentals of soldiering but would be barely introduced to the essentials of military engineering.

After a few confusing days at a reception center, the prospective engineer soldier was rushed to the replacement center. There he was given inoculations and a GI haircut, issued a gas mask, rifle, bayonet, and an assortment of clothes, assigned to strange barracks, and informed that he was quarantined for two weeks. During those two weeks of semiconfinement he drilled and marched, pitched tents, watched training films, saluted, and finally did not much care whether he was quarantined or not. Then he graduated to the obstacle course for advanced training in agility and endurance. This device for physical conditioning originated at Belvoir in 1941 and was copied immediately thereafter by other Army training centers. It was constructed on the most difficult terrain available and was usually an irregular horseshoe about 500 yards long and wide enough to accommodate several men at once. Barriers placed at intervals along this course required the men to climb cargo nets, jump hurdles, crawl through pipes, hop along a pattern of auto tires, and swing across a ditch of muddy water. The course could be made progressively harder, depending upon the speed at

which it was run, the type of uniform worn, and the amount of equipment carried.³⁷

During the first four weeks of drilling and physical conditioning the trainee spent many hours learning to fire the rifle, a recognition by the Engineers that the "one thing that is more important to the soldier than anything else is to be able to shoot straight and fast."³⁸ Ammunition during the spring of 1942 had to be carefully conserved. Only after much practice in "dry runs" and many hours of coaching in the correct positions was the trainee finally permitted to fire the rifle on the range. The hours devoted to marksmanship amounted to more than one week out of the eight, or 15 percent of the scheduled hours of training.³⁹

The trainees were assigned to training groups which were organized along regimental lines, with battalions, companies, and platoons. The groups conducted all basic military and tactical work. The ERTC staffs gave little actual instruction, acting instead as co-ordinating agencies in the use of training sites and materials. Individuals from these staffs circulated through the training areas to advise company officers and to fill in as needed in incidental instruction. They acted as full instructors only in certain of the Engineer subjects such as road building, which required the operation of power machinery.

In addition to the regular training of the normal selectees, the centers after July 1941 developed alternate programs for men with mental, emotional, physical, or educational

³⁷ (1) "Military Obstacle Course," *The Military Engineer*, XXXIII (July-August, 1941), 274-75; "Super Obstacle Course Unveiled at Fort Belvoir," *loc. cit.* (November, 1941), 504. (2) *Duck Board*, 13 February 1942 (publication of ERTC Belvoir). EHD files.

³⁸ *Duck Board*, 13 February 1942.

³⁹ (1) Ltr, S-3 ERTC Wood to OCE, 18 Dec 41. 352.11, ASFTC Wood, Pt. 1. (2) See Table 5.

TABLE 5—ENGINEER REPLACEMENT TRAINING CENTER PROGRAMED HOURS: 1940-41

Subject	12 Weeks 5 Sep 1940 Published	12 Weeks August 1941 Wood Actual	12 Weeks June 1941 Belvoir Actual	12 Weeks 20 Dec 1941 Revision	8 Weeks 19 Dec 1941 Published
Total.....	528	528.50	564	528	352
Basic, total.....	93	127.50	150	109	92
Battalion commander's address.....	0	.50	1	0	0
Articles of War and Army Regulations.....	2	2.50	2	5	4
Military courtesy.....	1	1.75	2		
Guard duty.....	2	3.75	5	3	3
Sex hygiene.....	2	3.75	2	6	6
Hygiene and sanitation.....	2		2		
First aid.....	3	3.75	6	8	4
Defense against chemical attack.....	5	5.75	6		
Care and maintenance of equipment.....	2	5.75	4	12	12
Display of equipment and tent drill.....	3	5.75	8		
Marches and camps.....	12	23.75	24	12	12
Close order drill.....	18	26.25	35	22	20
Extended order drill.....	5	9.50	8	10	8
Physical training.....	12	9.00	15	24	16
Field days.....	0	3.75	6	0	0
Inspections.....	24	22.00	24	16	16
Technical total.....	343	318.00	326	328	188
Combat					
Marksmanship, rifle.....	40	51.25	54	52	48
Bayonet.....	6	5.75	6	8	8
Grenade, hand.....	2	2.00	2	2	2
Musketry.....	3	11.75	8	12	12
Antiaircraft firing.....	6	8.00	6	8	8
Operation and use of .30-cal. machine gun.....	0	8.50	8	8	8
Engineer					
Field fortifications and camouflage.....	8	22.50	20	20	12
Use and supply of tools, equipment, and materials.....	12	11.25	10	12	4
Bridges.....	68	60.00	72	64	28
Obstacles.....	50	41.25	34	40	12
Demolitions and mining.....	44	30.00	32	32	12
Roads, construction and maintenance.....	52	15.00	24	20	8
General construction.....	24	15.00	12	16	8
Engineer reconnaissance.....	20	14.00	22	8	6
Night operations, technical.....	8	8.50	0	8	4
Rigging.....	0	13.25	16	18	8

TABLE 5—ENGINEER REPLACEMENT TRAINING CENTER PROGRAMED HOURS: 1940-41—Continued

Subject	12 Weeks 5 Sep 1940 Published	12 Weeks August 1941 Wood Actual	12 Weeks June 1941 Belvoir Actual	12 Weeks 20 Dec 1941 Revision	8 Weeks 19 Dec 1941 Published
Tactical, total.....	44	38.00	40	43	4
Scouting and patrolling.....	8	7.50	(^a)	8	8
Tactics of infantry squad.....	8	26.25	(^a)	24	20
Tactics of infantry platoon.....	10				
Tactics of infantry company.....	10				
Night operations, tactical.....	8	4.25	(^a)	8	8
Defense against air and mechanized at- tack.....	0	.00	(^a)	3	4
Open time.....	48	45.00	48	48	32

^a No breakdown of hours for each subject available.

Source: (1) MTP 5-1, 5 Sep 40. (2) MTP 5-2, 20 Dec 41. (3) Memo, AC of O&T Br for G-3, 19 Dec 41, sub: Curtailment of Tng in RTCs, with Incl, Sec. II, Program I, MTP 5-2. 353, RTCs, Pt. 1. (4) Ltr, ERTC Wood to CofEngrs, 19 Aug 41, sub: Tng Program for Second Increment of Trainees. 353, ASFTC Ft. Leonard Wood, Mo., 31 Jan 45, Bulky. (5) Ltr, ExO ERTC Belvoir to CofEngrs, 4 Jun 41, sub: Rev of Mob Tng Program, with 2d Ind, CG ERTC Belvoir to TAG, 4 Jun 41, with Incl, Tng Memo 64. 370.93, Mob Tng.

handicaps.⁴⁰ In August, Belvoir converted three white platoons from one battalion and one Negro platoon from another into a special training company. By January 1942 this responsibility had been spread to the three groups, one platoon in each group being filled with handicapped trainees. Although the Wood ERTC did not organize a formal unit for this training until October 1941, by August 1942 it had established special classes for several hundred illiterates, 11.7 percent of the Negro complement and 1.7 percent of the white, to enable them to read signs and directions, write letters, and do basic arithmetic. In October, one white company and two platoons from one Negro company were designated to form this unit. At both centers the men who were eventually assigned to these units began training under the regular program. After two weeks under observation they were referred to a reclassification board for reassignment. At Belvoir these men usually had five weeks of

special work while those at Wood had as much as eight weeks. At either center they could return to the normal program at any time upon the recommendation of the instructors. The desired level of attainment was the equivalent of the first two weeks of normal training and a fourth grade education.⁴¹ The special training units salvaged

⁴⁰ (1) Mob Regulations 1-7, 1 Oct 40. (2) Ltr, TAG to CofEngrs, 28 Jul 41, sub: Special Tng Units. 320.2, Pt. 29.

⁴¹ (1) 1st Ind, 23 Sep 41, on Ltr, Asst Adj Third Corps Area to CG ERTC Belvoir, 18 Sep 41, sub: Special Tng Units. Belvoir, 320.2, Orgn of the Army, Gen 1940-42, Sec. I. (2) 2d Wrapper Ind, ExO ERTC Belvoir to CofEngrs, 24 Jan 42, on Ltr, AGO to CofEngrs, 15 Jan 42, sub: Special Tng Units. 353, Pt. 17. (3) Ltr, Adj ERTC Wood to CofEngrs, 14 Oct 41, sub: Additional RTC Capacity. 320.2, RTCs, Pt. 1. (4) Ltr, CG ERTC Wood to CG Seventh Corps Area, 15 Sep 41, sub: Special Tng Unit. 320.2, Pt. 30. (5) Memo, ExO ERTC Wood for File, 20 Sep 41, sub: OCS and Special Tng Co, Bakers and Cooks Sch. Wood, 353, Tng, Misc. (6) Ltr, CG ERTC Wood to OCE, 27 Jan 42, sub: Special Tng Units. 353, Pt. 17.

many men but placed a double strain upon the facilities of the centers. The normal trainee capacity had to be reduced for these battalion-size units, over 600 men at Belvoir and between 500 and 600 at Wood. Many of the men remained for the combined length of both the special and regular programs, 13 weeks at Belvoir and 16 weeks at Wood.

By March 1942 this group constituted the greater part of several categories of men who were housed and trained for varying lengths of time by direction of the War Department. Their presence created cramped living conditions for everyone, including those undergoing the normal program. In addition, each center held over and gave special preparation to a group that varied from 100 to 200 men in an attempt to pool those best qualified to fill future OCS quotas. Moreover, one whole company setup of four barracks and a mess hall had to be maintained at each center for cadre retained for the activation of new units. Smaller groups of enlisted holdovers included cadre for RTC expansion and losses, and personnel for task force units.⁴²

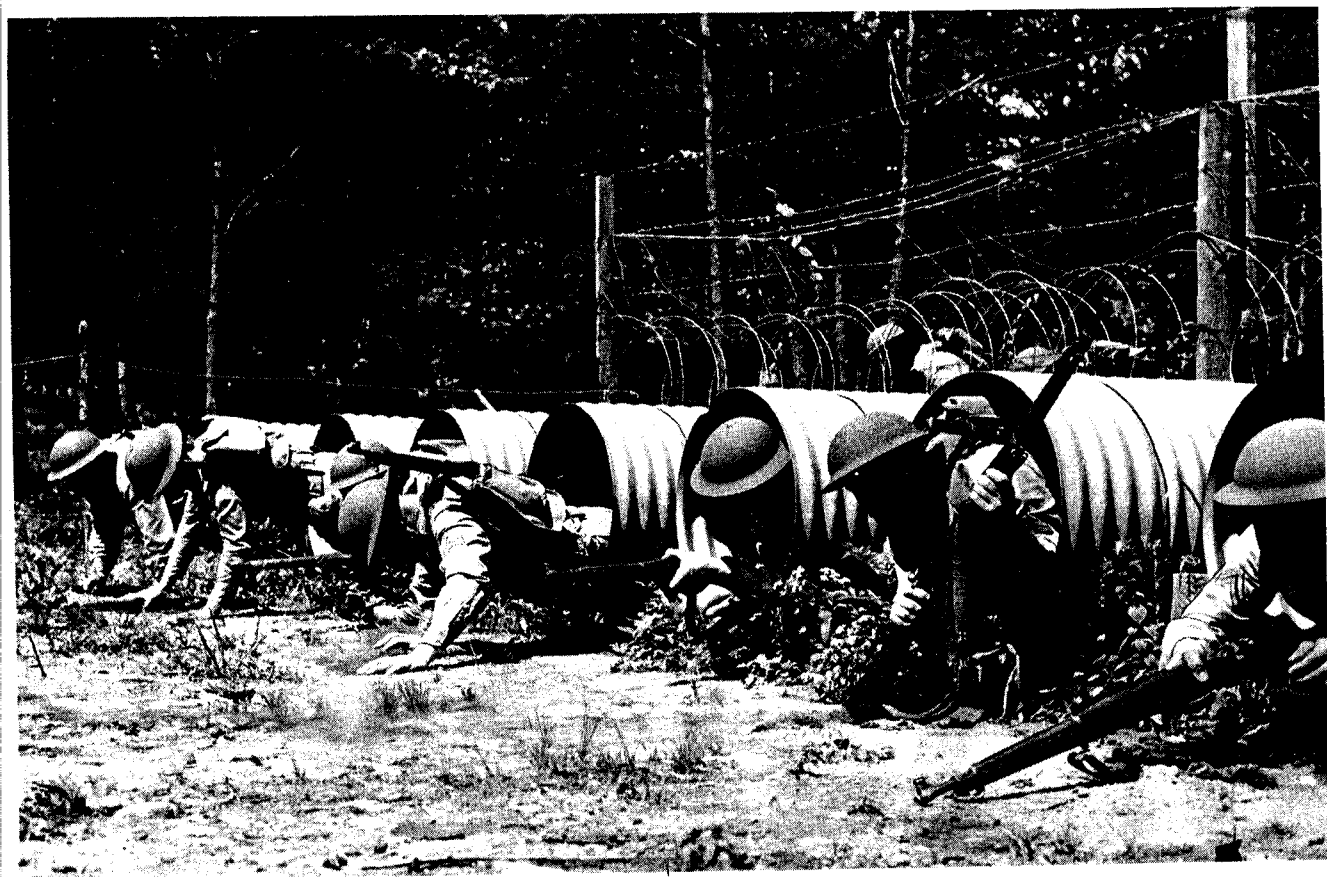
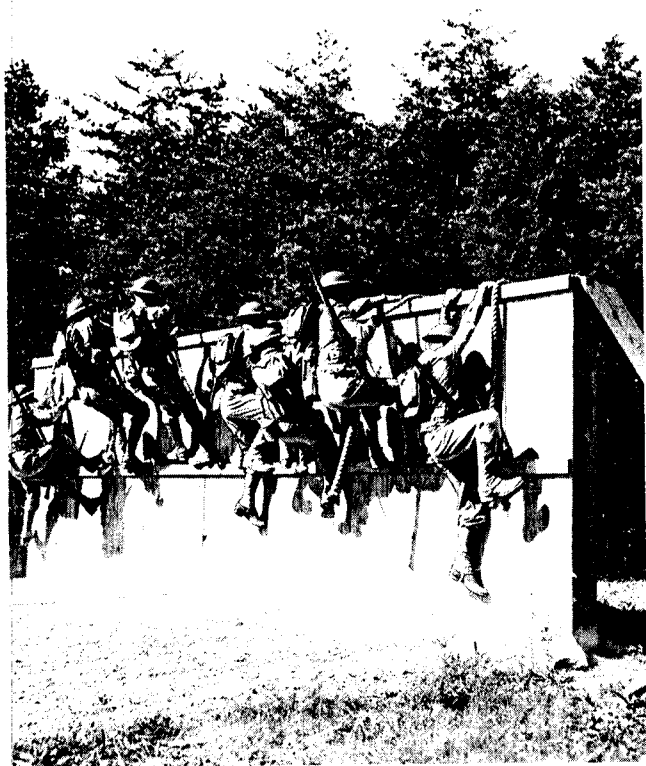
The eight-week course, in effect from December 1941 to March 1942, caused faster depreciation of sites, aids, and facilities. At Wood, the already overworked staff could not keep the facilities repaired fast enough and instruction at individual training sites was intermittently curtailed. Requisitions for new units "ruthlessly depleted" the training staff. But most serious of all, despite the shortened schedule and despite the larger capacities made possible through using tents and crowding the barracks, the great number of holdovers prevented any real increase in the total output of regular trainees. A comparison of the last three months of

1941 under the twelve-week program and the three months of 1942 under the reduced schedule shows an initial jump in output in the first few weeks under the new schedule but the numbers trained averaged about the same, 17,295 and 17,598, respectively, for the two three-month periods.⁴³

Although the eight-week program was unsatisfactory, it was also temporary. On 28 February 1942 the General Staff directed a gradual reversion to the twelve-week cycle beginning 15 March. Reversion to the twelve-week cycle automatically restored the time needed for training in such basic Engineer subjects as demolitions, bridging, road construction, and obstacles. (*Table 6, Columns 1 and 2*) This type of training was desperately needed, for the assumption that the creation of the engineer soldier could be safely left to his unit had soon proved false. With the rapid movement of troops overseas in the spring of 1942 it became clear that in many cases the training received by these fillers in replacement centers was all they would get before reaching a theater. Moreover, the product of the centers would in the future

⁴² (1) Ltr, AGO to CofEngrs, 31 Mar 42, sub: Additional Constr at RTCs, with Incl, 24 Mar 42, and 1st Ind, OCE to C of Rqmts Div SOS, 27 Apr 42, and 2d Wrapper Ind, Hq ERTC Belvoir to CofEngrs, 10 Apr 42. 600.1, RTCs, Pt. 1. (2) Ltr, ExO ERTC Belvoir to CofEngrs, 12 Jan 42, sub: Increased Tng Capacity Using Tent Camp. Belvoir, 680.1, RCs, 1940-42. (3) 1st Ind, 20 Jan 42, on Memo, AC of O&T Br for CG ERTC Belvoir, 16 Jan 42, sub: Expansion of ERTC, Ft. Belvoir. 320.2, ERTC Belvoir, Pt. 1. (4) 1st Ind, 22 Jan 42, on Ltr, ACofEngrs to TAG, 8 Jan 42, sub: Increase in ERTC, Ft. Belvoir. Same file. (5) Rad, OCE to CG ERTC Wood, 19 Jan 42. 320.2, ASFTC Wood. (6) Ltr, Adj ERTC Wood to CofEngrs, 12 Feb 42, sub: Increase of Cadre. Same file.

⁴³ Ltr, CG ERTC Wood to CofEngrs, 20 Jan 42, sub: Shortages and Allots of Enl Pers. 220.3, ERTC Wood.



OBSTACLE COURSE, FT. BELVOIR, 1941

TABLE 6—ENGINEER REPLACEMENT TRAINING CENTER PROGRAMED HOURS: 1942-43

Subject	12 Weeks 11 May 1942 Wood Actual	12 Weeks 11 May 1942 Belvoir Actual	12 Weeks 7 Sep 1942 Wood Actual	12 Weeks 4 May 1943 Published	17 Weeks 1 August 1943 Published
Total.....	576.00	564.00	576.00	576.00	816.00
Orientation.....	1.50	1.00	0.00	0.00	17.00
Articles of war and Army regulations.....	1.75	2.00	3.00	3.00	5.00
Military courtesy.....	1.75	4.00	3.00	5.00	5.00
Guard duty.....	3.50	5.00	10.00	12.00	12.00
Hygiene and sanitation.....	3.50	3.00	3.00	3.00	8.00
First aid.....	3.50	6.00	8.00	8.00	8.00
Care and maintenance of equipment.....	5.25	4.00	5.00	5.00	8.00
Display of equipment and tent drill.....	5.25	4.00			
Safeguarding military information.....	0.00	0.00	1.00	1.00	3.00
Defense vs. chemical attack.....	5.25	6.00	5.00	5.00	8.00
Marches and camps.....	26.50	20.00	23.00	24.00	28.00
Close order drill.....	40.25	36.00	26.00	30.00	26.00
Extended order drill.....	10.00	6.00	4.00	4.00	6.00
Physical training.....	21.00	15.00	22.00	17.00	20.00
Field days.....	3.50	6.00	0.00	0.00	0.00
Inspections and ceremonies.....	28.00	20.00	24.00	24.00	32.00
Rifle marksmanship.....	58.50	54.00	^a 58.00	^a 65.00	^a 76.00
Machine guns.....	12.00	8.00	12.00	15.00	18.00
Bayonet.....	7.50	6.00	8.00	6.00	8.00
Grenades.....	1.75	2.00	4.00	3.00	6.00
Musketry.....	20.00	12.00	20.00	12.00	12.00
Antiaircraft firing.....	8.00	6.00	9.00	9.00	9.00
Scouting and patrolling.....	7.00				
Combat principles, including defense vs. air and mechanized attack.....	32.50	44.00	33.00	28.00	38.00
Night operations, tactical.....	4.50		4.00	(^b)	(^c)
Engineer reconnaissance.....	8.75	16.00	11.00	23.00	19.00
Tools and equipment.....	14.00	18.00	12.00	11.00	16.00
Rigging.....	14.00	16.00	17.00	17.00	17.00
Fixed bridges.....	28.00	32.00	32.00	32.00	48.00
Night operations, bridges.....	4.50				
Floating bridges.....	36.00	40.00	36.00	40.00	54.00
Roads.....	21.00	20.00	16.00	15.00	24.00
Night operations, roads.....	4.50				
General construction.....	14.00	12.00	16.00	15.00	13.00
Field fortifications and camouflage.....	21.00	20.00	20.00	16.00	16.00
Obstacles.....	28.00	32.00	24.00	29.00	20.00
Demolitions.....	28.00	32.00	29.00	28.00	24.00
Training tests.....	0.00	0.00	22.00	16.00	17.00
Reserved for battalion commander.....	42.00	48.00	48.00	51.00	82.00
Carbine and .45-cal. submachine gun.....	0.00	0.00	0.00	4.00	0.00
.37 mm. gun.....	0.00	8.00	0.00	0.00	0.00
Village fighting.....	0.00	0.00	0.00	0.00	4.00
Map reading.....	0.00	0.00	0.00	0.00	12.00
Tactical and engineer field operations.....	0.00	0.00	0.00	0.00	39.00

TABLE 6—ENGINEER REPLACEMENT TRAINING CENTER PROGRAMED HOURS: 1942-43—Con.

Subject	12 Weeks 11 May 1942 Wood Actual	12 Weeks 11 May 1942 Belvoir Actual	12 Weeks 7 Sep 1942 Wood Actual	12 Weeks 4 May 1943 Published	17 Weeks 1 August 1943 Published
Booby traps and antipersonnel mines.....	0.00	0.00	0.00	0.00	8.00
Laying and passage of mine fields.....	0.00	0.00	0.00	0.00	32.00
Familiarization firing, individual weapons.....	0.00	0.00	0.00	0.00	8.00
Hand to hand combat.....	0.00	0.00	0.00	0.00	8.00
Infiltration course.....	0.00	0.00	0.00	0.00	2.00

^a Includes antiaircraft firing.

^b Five night operations of four hours or more each scheduled outside of the listed hours of the program.

^c Fifty-six hours of night operations outside of regular listed hours.

Source: (1) Office Memo, Plans and Tng Off ERTC Wood for CG ERTC Wood, 11 May 42, sub: Comparison of Ft. Belvoir ERTC Tng Program with Ft. Leonard Wood ERTC Tng Program. Wood, 353, Tng, Misc. (2) 1st Ind, 7 Sep 42, with Incl, Twelve Wks Tng Program, on Ltr, C of O&T Br to CG ERTC Wood, 29 Aug 42, sub: Tng Program. Wood, 353.01, Tng Schedules. (3) MTP 5-2, 4 May 43. (4) MTP 5-6, 1 Aug 43.

have to qualify as battle loss replacements in existing units.⁴⁴

The institution of the twelve-week program, which made possible an increase in both basic and technical training, coincided with the formation of SOS. The Training Division, SOS, henceforth acted as a central co-ordinating agency, establishing policies, standardizing programs, and determining course content and length. Through numerous reports and frequent inspections SOS maintained close supervision over all aspects of training. The constant objective was uniformity, the production of men at a predictable level of proficiency. But although the policies set forth by SOS influenced technical training at Engineer centers, SOS was most successful in standardizing the basic military training common to all the services under its control.⁴⁵

From May until August 1942, SOS influenced this training through changes in subject matter or by shifting stress from one aspect of a subject to another. It directed emphasis upon the use of cover and concealment by the individual rather than by units. It restricted instruction in identification of

aircraft and combat vehicles to those of the United States. The assumption in both cases was that this limited training would simplify subsequent unit instruction, which would amplify this basic information according to the needs of the theater in which the unit would operate.⁴⁶ Closer control of this part of replacement training came in August when SOS issued a basic military program to be used by all SOS centers during the first four weeks. Out of the total of 192 hours available in the four weeks, 163 were prescribed by SOS, the remaining number being left open for either additional hours in these subjects or for the presentation of introductory Engineer material. Around

⁴⁴ Memo, AC of O&T Br, 24 Jan 42, sub: Program of Tng at ERTCs. 320.2, ERTCs, Pt. 1.

⁴⁵ Speech, Dir Tng SOS at Conf of Comdrs of SvCs [31 Jul 42], sub: Tng Responsibilities in SOS. 337, Pt. 1.

⁴⁶ (1) Memo, Dir Tng SOS for CofEngrs *et al.*, 31 Jul 42, Use of Time Designated To Train Individuals in Airplane Recognition and Concealment and Concealment Discipline. 353, Pt. 18. (2) Memo, CG ERTC Wood for Adj ERTC Wood, 6 Mar 43, sub: Tng Notes, with Incl, Conf Notes on RTCs and Basic Mil Tng, prepared by Dir Tng SOS on conf held 8-10 Feb 43. Wood, 353, Tng.



SOLDIERS FIRING THE SPRINGFIELD M1903 *at the Engineer Replacement Center, Ft. Leonard Wood, Mo., April 1942.*

this hard core of prescribed hours the Engineers rescheduled the five weeks of basic training that preceded the seven weeks of tactical and technical work. By September the two centers had worked out their individual versions. Little additional instruction beyond that specified by SOS could be given during this first four weeks because a few hours had to be reserved each week as open time to compensate for interruptions. During the fifth week, instruction shifted completely to Engineer subjects.⁴⁷

Rifle firing remained by far the most important subject in the basic military program, and SOS constantly urged the improvement of instruction in this field. As early as July 1942 the Director of Training, SOS, had expressed dissatisfaction with the standards for record firing and had set up a single standard for all centers. Every trainee

was to fire for record before leaving the ERTC or, if he did not, the failure to do so was to be minutely explained. Of those firing, 80 percent were to qualify. A monthly report had to be submitted as a check upon performance. The training program prescribed in August went further in designating the type of ranges to be used and specified that rifle firing for record should be completed within the first four weeks. The Wood center had only one very small 300-yard firing point, and Belvoir only one suitable range of 88 targets. Instruction was further hampered by the relatively low

⁴⁷(1) Ltr, Brig Gen C. R. Huebner, Dir Tng SOS, to All Concerned, 28 Aug 42, sub: Basic Tng Program. Hq EAC, 353, Tng. (2) Hq SOS, Basic Tng Program for All RTCs and Sv Units of Sup and Adm Svs SOS, Aug 42. Ft. Lewis, 353, Tng, 6 Sep 42 —.

priority given to the training centers for ordnance equipment. The Garand M1 rifle did not reach the two centers until December 1942. Meanwhile the older Springfield could not be obtained in sufficient quantities for each trainee to have his own weapon. No carbines were available at either center until August 1942, when the Engineers finally resorted to a special issue of four to each center for demonstration purposes. In the face of such weapon shortages and the lack of suitable ranges, the ERTC's obtained permission in September 1942 to spread rifle instruction throughout the five weeks of basic training instead of confining it to the first four weeks.⁴⁸

The centers had extreme difficulty meeting the 80 percent standard. Neither approached the mark for months, as shown by the following table on record firing at ERTC's from July through December 1942.⁴⁹

Month	Belvoir		Wood	
	White	Negro	White	Negro
July.....	64	39	(a)	(a)
August.....	75	25	(a)	(a)
September.....	66	60	58	17
October.....	78	37	(a)	(a)
November.....	79	(a)	57	(a)
December.....	81	78	73	15

^a Record not available.

December was the only month in 1942 in which Negro troops at Belvoir reached an adequate score. Investigation proved the firing score to be the result of false marking and scoring of targets, and the whole firing procedure had to be reorganized. The scores thereafter dropped to the previous levels. As a result of reprimands for poor marksmanship, Wood revised its rifle training in December, giving special attention to Negro troops and to slow learners. A team of forty-eight white expert coaches devoted all its

time to the Negro battalions, starting early in January 1943.⁵⁰

In teaching marksmanship, military courtesy, drill, and other aspects of basic military training the ERTC's aimed at sending out a product interchangeable with that of other SOS centers, but the ultimate goal of Belvoir and Wood was to produce a technically trained engineer soldier. Seven weeks out of the twelve were devoted to technical training in combination with tactical instruction. The trainee learned the essentials of engineer reconnaissance—to note such important things as possible bridge sites, the width and flow of streams, the condition and contour of terrain for road building, and strategic locations for tank obstacles and mine fields. He learned to co-ordinate his efforts with groups of increasing size in tactical exercises, first squads, then platoons, and finally companies. Weapons instruction also shifted to group activity. Rifle instruction continued with emphasis upon the techniques of con-

⁴⁸ (1) Memo, AC of O&T Br, 4 Sep 42, Inspec of Tng, 1-3 Sep 42. 353, ASFTC Claiborne, Pt. 1. (2) Memo, Supervisor Weapons Tng ERTC Wood for Plans and Tng Off ERTC Wood, 14 Apr 42. Wood, 333.1, Inspec. (3) Ltr, ExO ERTC Belvoir to CofEngrs, 8 Sep 42, sub: Authority To Fire Qualification Course "C," Rifle Model 1903, with 1st Ind, CG Ft. Belvoir to CofEngrs, 11 Sep 42. Belvoir, 353.15, Marksmanship, 1942. (4) Memo, Grant for Wolfe, 16 May 42, sub: Subjects To Be Taken Up in OCE, with Notes on Gen Grant's Memo for Col Wolfe. 322, ASFTC Wood. (5) Ltr, ExO Belvoir to CofEngrs, 10 Aug 42, sub: Carbine, .30-Cal. M1. 475, ASFTC Belvoir. (6) Ltr, AC of O&T Br to CG SOS, 22 Aug 42, same sub. Same file. (7) Ltr, C of O&T Br to Dir Tng SOS, 10 Sep 42, sub: Rifle Marksmanship, ERTCs, with 1st Ind, 15 Sep 42. Wood, 353.15, Marksmanship.

⁴⁹ (1) 353.15, ERTC Belvoir. (2) 353.15, ASFTC Wood. (3) Wood, 353.15, Marksmanship.

⁵⁰ Memo, Dir Tng SOS for CofEngrs, 16 Jan 43, sub: Small Arms Record Firing, with 2d Wrapper Ind, CG ERTC Wood to CofEngrs, 23 Jan 43. 353.15, Ft. Wood.

centrating the fire power of small units. With the return to the twelve-week program, 20 percent of the trainees were supposed to learn to fire the .50-caliber machine gun and the 37-mm. antitank gun, but so few of these weapons could be obtained that for all practical purposes the .30-caliber machine gun remained the principal crew-served weapon. In technical Engineer subjects the trainee learned to work with other men in building floating and fixed bridges and various types of roads and obstacles.⁵¹

Finding training films inadequate for familiarization in technical Engineer subjects, the centers prepared elaborate sets of more tangible training aids. Sand tables duplicating in miniature the territory through which the men would move simplified tactical problems involving engineer operations. Short sections of temporary and permanent surfacing gave the trainee a general picture of road building for a variety of weather and terrain. Scale models of fixed and floating bridges, with structural parts painted in bright colors for positive identification, were an important part of the first lessons in this subject and saved hours in construction time at the bridge sites. In demolitions, classroom instruction included the use of models of common highway and railroad bridges to demonstrate strategic points to place explosives for maximum destruction. At the training site, large signs and billboards repeated the best methods of demolishing railroad tracks, concrete beams, and steel truss bridges. Classes in general construction used a series of models of temporary wooden buildings in successive stages of construction to show building procedures. At the building sites large display boards held short identified sections of the most common sizes of lumber, types of joints, and the nails, hinges, and other hard-

ware which went into such construction. Numerous "knot boards" demonstrating types of knots, splices, and lashings were distributed to the barracks to keep the men conscious of the fundamentals of rigging during off-hours. OCE encouraged an interchange of ideas between the two centers and authorized visits by members of the two ERTC training staffs to witness new methods and aids in operation.⁵²

Although training aids served to shorten the introductory phase of each subject, practical working exercises were the essence of engineer training. The men learned by doing. At Belvoir, six companies could train at the same time in the floating bridge area, a dredged channel 2,000 feet long and from 130 to 250 feet wide. The fixed bridge area across Accotink Creek provided space for 4 steel bridges, 16 wooden trestle bridges, and 48 footbridges simultaneously. In a typical week of training in the late summer of 1942, the trainees built some 180 bridges in these areas. A program on the same scale was carried out at the Wood center. But in spite of the excellent bridging facilities at both ERTC's, the men had no training during 1942 in the erection of the Bailey bridge. American units in England received some training on the Bailey in late 1942, but it was not until February 1943, when the Corps of Engineers finally adopted the Bailey, that any of these bridges were designated for training in the United States.

⁵¹ (1) Ltr, Adj Wood to CofEngrs, 22 Aug 42, sub: Tng Equip. 472, ASFTC Wood. (2) Ltr, Adj ERTC Wood to CofEngrs, 24 Jul 43, sub: Request for Guns, Machine, .50-Cal., with 2d Ind, AC of Equip Br Trps Div to CG ASF, 6 Aug 43. 472.5, ASFTC Wood.

⁵² (1) FM 21-7, List of Tng Films, Film Strips, and Film Bulls, 1 Jan 43. (2) Rpt, Tng of Repls, Fillers, and Cadres, CE, Ft. Belvoir, 6 Mar 41-30 Jun 44, pp. 11, 12. Engr Sch Library.

By the end of March, only 4 had been issued for troop use and in the next month only 24. Few men beginning training at the time these bridges were released could have appeared in combat zones before the latter part of 1943.⁵³

Since it was not assumed that the engineer soldier could perform any task until he had done it, each man learned to make up both electric and nonelectric priming charges during demolitions training, and fired high explosives to break reinforced concrete pillars and steel beams. Bangalore torpedoes (metal pipes packed with a high explosive) were used to breach actual roadblocks and antitank obstacles as well as to make a path through simulated mine fields. The trainee not only learned the proportions of various explosives necessary for most engineering purposes but gained confidence in his ability to use them effectively.⁵⁴

The centers divided the twenty hours of instruction in road building into four parts. In the first four-hour period the men assembled at the road building site with shovels, picks, saws, crowbars, axes, mauls, sledges, and machetes. Supervisors from the staff brought bulldozers and road graders, rakes, tampers, wheelbarrows, cement, sand, gravel, and landing mat. Following demonstrations with the earth-moving machinery, there was a short lecture on the major characteristics of good road building. The men then broke up into small working parties. Some spread gravel, others dug ditches, while still others laid concrete culvert pipes. Then they all moved to the adjacent landing field site where they received instruction in clearing, grubbing, and draining a field, and laid a small section of mat. At still another site they built wooden forms, mixed and poured concrete, and set it to cure with wet burlap. In the second period,

again four hours, they learned expedient road building under swamp conditions, building short sections of corduroy, plank, plank-tread, log mat, wire mesh, and landing mat roads. The third period of eight hours was for road repair and maintenance, limited to emergency repairs including drainage, placing of culverts, removal of obstacles, and the detouring of traffic. The last four-hour period was a night operation in which each platoon had a definite task. It might be given a stretch of swamp road to build, or a road or trail to repair involving filling or bridging a crater. Each project was tested by having a truck drive over the completed work.⁵⁵

In examinations as well as in instruction, emphasis was upon demonstration. Both centers agreed that the major part of the testing should require active proof of acquired skills rather than mere answers to questions. The ERTC's did diverge widely in their views upon the frequency of these tests and their content, however. The Wood center developed a system of frequent testing of small amounts of subject matter at a time while Belvoir held constant reviews toward a final examination. Each system had its advantages. There was little basis for comparison of the product of the two centers as long as the methods of determining proficiency varied so widely. The

⁵³ (1) Engr Bd Rpt 729, 5 Dec 42, Panel Bridge (Bailey Type), H-10 and H-20 Bridge. (2) 1st Ind, 4 Feb 43, on Memo, ACofS Materiel ASF for CofEngrs, 16 Jan 43, sub: Co-ordination of Vehicles Design With Capacities of Mil Bridges. 1st Ind in 417, Pt. 13; basic in 451, Pt. 1. (3) ASF Monthly Progress Rpt, Sec. 2-A, Distribution, 30 Apr 43 (C).

⁵⁴ 1st Ind, 9 Dec 42, on Ltr, C of O&T Br to CO ERTC Wood, 5 Dec 42, sub: Tng Tests. Wood, 353, Tng, Gen.

⁵⁵ Lesson Outlines, ERTC Ft. Belvoir, Nov 42, pp. 479-96. EHD files.

Wood center, in the latter part of July 1943, made the two systems uniform by adding a final examination patterned directly after that in use at Belvoir.⁵⁶

During 1942 the ERTC's produced 79,571 engineer soldiers, 70 percent of whom entered directly into SOS units. Although by March the training program had been lengthened from eight to twelve weeks, the period from January to the autumn of 1942 was marked by great haste in training and by temporary measures designed to produce quantities of men to fill new units. There was little specialized training. The centers concentrated on teaching these men basic military skills and giving them a fundamental grasp of engineer tasks and techniques so that they might with additional unit training fill any engineer position. Similar emergency measures dominated the officer training program. Reluctantly, the Engineers had to presume that experience in the field would accomplish what the training program could not. Throughout 1942 the military construction program demanded the services of many of the Corps' most

experienced officers and a large portion of its Reserve. It was not, however, the transfer of the construction program to the Corps which created this situation. The first inroads upon Engineer Regulars and Reserves had been made while the program was under the control of The Quartermaster General. The intraservice struggle over troop-age officers in the spring of 1942 was but a continuation of an interbranch feud. Certainly troop activities suffered no more from officer shortages after the transfer than they had previously. Amid the rush to supply officers and men to the new units the Engineers continued to devote a large measure of attention to perfecting unit organization, first applying the lessons learned during the defense period and then beginning an adjustment to the growing demand for service troops which was to prove one of the most characteristic aspects of global warfare.

⁵⁶ (1) Ltr, Tng Div ERTC Wood to Tng Div ERTC Belvoir, 19 Jul 43. Belvoir, 353, Tng, 1943.
(2) Ltr, Tng Div ERTC Belvoir to Tng Div ERTC Wood, 24 Jul 43. Same file.